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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/034,185	01/03/2002	Yong Min Ha	041501-5479	7731

7590 10/06/2003
MORGAN, LEWIS & BOCKIUS LLP
1800 M Street, N.W.
Washington, DC 20036

EXAMINER

SAID, MANSOUR M

ART UNIT	PAPER NUMBER
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2673

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DATE MAILED: 10/06/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/034,185

Applicant(s)

HA, YONG MIN

Examiner

MANSOUR M SAID

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 03 January 2002.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-7 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-7 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____
- 4) ☐ Interview Summary (PTO-413) Paper No(s). _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____

DETAILED ACTION

Drawings

1. The drawings are objected to under 37 CFR 1.83(a). The drawings must show every feature of the invention specified in the claims. Therefore, the “**third digital to analog converter**” and the “**level shifter**” must be shown or the feature(s) canceled from the claim(s). No new matter should be entered.

A proposed drawing correction or corrected drawings are required in reply to the Office action to avoid abandonment of the application. The objection to the drawings will not be held in abeyance.

Claim Rejections - 35 USC § 103

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

3. Claim 1 is rejected under 35 U.S.C. 103(a) as being unpatentable over Applicant Prior Art (hereinafter referred to as APA) in view of Sagawa et al. (6,452,526 B2; hereinafter referred to as Sagawa).

As to claim 1, APA teaches a data driving circuit of an LCD device (LCD display, (figure 1, (1)) comprising a timing controller (timing controller, (figure 1, (3)) for formatting input data (display data) so that data and gate drivers (gate driver, (figure 1, (1a)) of an LCD

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panel display a picture image (LCD display, (figure 1, (1)), and outputting a selection signal (specification page 2, lines 15-21 and page 3, lines 1-16); a digital to analog converters (DA, (figure 1, (5)) for converting digital signals output from the timing controller (timing controller, (figure 1, (3)) to analog signals based on a color gray level displayed (specification page 3, lines 1-16).

APA dose not expressly disclose a plurality digital to analog converters and a plurality of amplifiers for amplifying the signals output from the respective digital to analog converters and outputting the amplified signals to the LCD panel.

However, Sagawa teaches a plurality digital to analog converters (D/A converters, (figures 1 & 7, (111, 112 & 113)) and a plurality of amplifiers (amplifiers, (figures 1 & 7, (151,152,153 & 156)) for amplifying the signals output from the respective digital to analog converters and outputting the amplified signals to the LCD panel (LCD, (figure 7, (100)) (figures 1, 7 & 15; abstract; column 1, lines 10-19; column 1, lines 58-67; column 2, lines 1-23; column 6, lines 10-45, and column 14, lines 57-67).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to incorporate Sagawa's an image signal processing circuit having plurality digital to analog (D/A) and plurality amplifiers into APA's display device so as to provide a method of capable of adjusting quickly and accurately the output amplitude of a plurality of digital-analog converters (column 2, lines 65-67).

4. Claim 2 is rejected under 35 U.S.C. 103(a) as being unpatentable over APA in view of Sagawa as applied to claim 1 above, and further in view of Kwon (6,577,293 B1).

APA and Sagawa teach all **claim 2** except a plurality of multiplexes for selecting a signal output.

However, Kwon teaches a plurality of multiplexes (MUXs, (figure 10B, (80)) for selecting a signal output (column6, lines 58-67 and column 7, lines 1-11).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to incorporate Kwon's LCD display having a plurality multiplexes into APA's modified device so that the external control signal to output the selected one to the pixels (column 7, lines 1-11).

5. Claims 3-4 are rejected under 35 U.S.C. 103(a) as being unpatentable over APA in view of Sagawa as applied to claim 1 above, and further in view of Mitani et al. (5,714,953; hereinafter referred to as Mitani B1).

As to **claims 3-4**, As best understood, APA and Sagawa teach all claimed limitation except that the digital to analog converter serving to obtain a multigray (64 gray or 6 bit), intermediate gray (16 gray or 4 bit), and a low gray (2 gray, 1 bit) image.

However, Mitani teaches that the digital to analog converter serving to obtain a multigray (64 gray or 6 bit), intermediate gray (16 gray or 4 bit), and a low gray (2 gray, 1 bit) image (figures 2-10; abstract, column 5, lines 33, column 7, lines 4-15; column 7, lines 25-67; column 9, lines 40-65, and column 16, line 54 through column 17, line 7).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to incorporate Mitani's teaching into APA's modified system so as to provide a composite D/A converter capable of effecting the D/A conversion with high precision

in a relatively small pattern occupancy area even when the number of conversion bits is large (column 4, lines 63-67).

6. Claim 5 is rejected under 35 U.S.C. 103(a) as being unpatentable over Applicant Prior Art (hereinafter referred to as APA) in view of Sagawa et al. (6,452,526 B2; hereinafter referred to as Sagawa), and further in view of Kwon.

As to claim 5, APA teaches a data driving circuit of an LCD device (LCD display, (figure 1, (1)) comprising a timing controller (timing controller, (figure 1, (3)) for formatting input data (display data) so that data and gate drivers (gate driver, (figure 1, (1a)) of an LCD panel display a picture image (LCD display, (figure 1, (1)), and outputting a selection signal (specification page 2, lines 15-21 and page 3, lines 1-16); a level shifter (level shifter, (figure 1, (4)) for amplifying voltage levels of signals output from the timing controller (timing controller, (figure 1, (3)) (specification page 3, lines 1-16); a digital to analog converters (DA, (figure 1, (5)) for converting digital signals output from the timing controller (timing controller, (figure 1, (3)) to analog signals based on a color gray level displayed (specification page 3, lines 1-16).

APA does not expressly disclose a plurality digital to analog converters and a plurality of amplifiers for amplifying the signals output from the respective digital to analog converters and outputting the amplified signals to the LCD panel.

However, Sagawa teaches a plurality digital to analog converters (D/A converters, (figures 1 & 7, (111, 112 & 113)) and a plurality of amplifiers (amplifiers, (figures 1 & 7, (151,152,153 & 156)) for amplifying the signals output from the respective digital to analog converters and outputting the amplified signals to the LCD panel (LCD, (figure 7, (100)) (figures

1, 7 & 15; abstract; column 1, lines 10-19; column 1, lines 58-67; column 2, lines 1-23; column 6, lines 10-45, and column 14, lines 57-67).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to incorporate Sagawa's an image signal processing circuit having plurality digital to analog (D/A) and plurality amplifiers into APA's display device so as to provide a method of capable of adjusting quickly and accurately the output amplitude of a plurality of digital-analog converters (column 2, lines 65-67).

APA and Sagawa do not teach expressly disclose a plurality of multiplexes for selecting a signal output.

However, Kwon teaches a plurality of multiplexes (MUXs, (figure 10B, (80)) for selecting a signal output (column 6, lines 58-67 and column 7, lines 1-11).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to incorporate Kwon's LCD display having a plurality multiplexes into APA's modified device so that the external control signal to output the selected one to the pixels (column 7, lines 1-11).

7. Claims 6-7 are rejected under 35 U.S.C. 103(a) as being unpatentable over APA, Sagawa in view of Kwon as applied to claim 5 above, and further in view of Mitani et al. (5,714,953; hereinafter referred to as Mitani B1).

As to claims 6-7, As best understood, APA, Sagawa and Kwon teach all claimed limitation except that the digital to analog converter serving to obtain a multigray (64 gray or 6 bit), intermediate gray (16 gray or 4 bit), and a low gray (2 gray, 1 bit) image.

However, Mitani teaches that the digital to analog converter serving to obtain a multigray (64 gray or 6 bit), intermediate gray (16 gray or 4 bit), and a low gray (2 gray, 1 bit) image (figures 2-10; abstract, column 5, lines 33, column 7, lines 4-15; column 7, lines 25-67; column 9, lines 40-65, and column 16, line 54 through column 17, line 7).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to incorporate Mitani's teaching into APA's modified system so as to provide a composite D/A converter capable of effecting the D/A conversion with high precision in a relatively small pattern occupancy area even when the number of conversion bits is large (column 4, lines 63-67).

Conclusion

8. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Tanaka (6,356,223 B1) teaches a D/A. conversion circuit in accordance with the present invention.

Jeong (6,373,459 B1) teaches a devices and method for driving a liquid crystal display.

9. Any inquiry concerning this communication or earlier communications from the Examiner should be directed to **Mansour M. Said** whose telephone number is **(703) 306-5411**.

The examiner can normally be reached on Monday through Thursday from 8:30 a.m. to 6:00 p.m. The examiner can also be reached on alternate Friday from 8:30 a.m. to 5:00 p.m. EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, **Shalwala Bipin**, can be reached at **(703) 305-4938**.

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Any response to this action should be mailed to:

Commissioner of Patents and Trademarks

Washington, D.C. 20231

Or faxed to:

(703) 872-9314 (for Technology Center 2600 only)

Hand-delivered responses should be brought to Crystal Park II, 2121 Crystal


Drive, Arlington, VA, Sixth Floor (Receptionist)

10. Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the Technology Center 2600 Customer service Office

Whose telephone number is (703) 306-0377.

September 30, 2003

Mansour M. Said


BIPIN SHALWALA
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 2600